MAY 1986

In this issue: **ENGINEERED FOODS** $3.00

ADVISORY

Our Executive Advisory Panel looks at ingredients buying. They evaluate trends, prices, and new areas of opportunity.

INSTRUMENTS

The tools for lab analysis are becoming more efficient, less time-consuming, and more automated.

CHECK OUT

If you want your products on supermarket shelves, you'll have to prove to their computers that you belong there.

Chilton's Food Engineering

COVER STORY

This survey of *Food Engineering's* Executive Advisory Board reveals their opinions about current trends and factors that affect ingredient buying patterns.

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33 Rating the food companies
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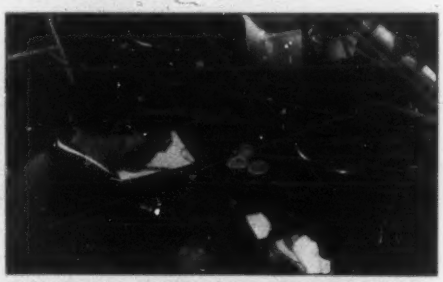

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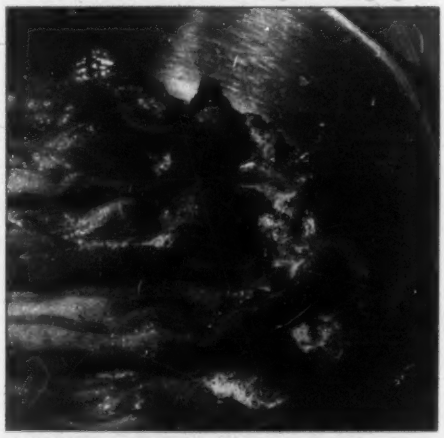


CURING BACON: Recent studies have shown that α-tocopherol coated salts are effective in inhibiting N-nitrosamine formation in three types of bacon. **PAGE 68**

Special Emphasis

ANALYTICAL INSTRUMENTATION: This month's special emphasis section examines advances in analytical instrumentation and their effects on the analysis of food. **Pages 142 to 148**

Budget cuts stifle meat industry expansion efforts

Cost-cutting measures inside the U.S. Department of Agriculture are stunting expansion efforts of growing meat and poultry firms.

Due to a hiring freeze, USDA's Food Safety and Inspection Service is relinquishing requests for additional meat and poultry inspection services—a mandate for all meat and poultry processors.

And with an attrition rate of about 50 inspectors per month and $3.4-million in the budget still to cut, FSIS may find it hard to even stay on an even keel. The agency expects to lose 8 percent of its in-plant inspection force by October.

Food firms face difficulties

FSIS Representative Pat Drayne admits the agency is "having difficulty meeting inspection requests."

The red meat and poultry industries—as well as prepared meat product manufacturers—are encountering obstacles. "Our members are having problems receiving additional inspection services," says American Meat Institute Vice President of Fresh Meats Jim Hodges. "This affects their ability to increase line speeds, add shifts and open new plants."

National Broiler Council Representative Kerry Wagner says some of her members, too, are finding their inspection service requests "held in abeyance."

FSIS Representative Drayne predicts that in time, the poultry industry will be the hardest-hit. Poultry production, which increased 5 percent in 1985 alone, is forecasted to grow another 5 percent in 1986, thanks to rising producer profits and increased consumer demand, says the U.S. Department of Commerce.

Adds a National Food Processors Association spokesman: FSIS Administrator Donald Houston "doesn't think he can fulfill requests from processors now sitting on his desk."

Is there a doctor in the house?

FSIS is proposing a number of legislative remedies:

• *User fees.* Much to the food industry's dismay, FSIS wants to charge slaughter houses for inspection services—traditionally paid for by Uncle Sam. The annual bill would exceed $350-million.

The Reagan Administration supports the user-fee concept, calling the present system nothing more than a "hidden subsidy" for food firms. But Congress, the ultimate decision-maker in this case, has yet to declare a unified position.

• *Two-sided proposal.* FSIS is also asking Congress for ability to vary inspection intensity. Right now, all slaughter houses and processing lines must be inspected continuously—despite volume, type of product and compliance history.

In order to successfully execute this "discretionary inspection" concept, however, FSIS is also asking for jurisdiction to immediately deny inspection services to negligent plants. Food firms vehemently argue against this half of the proposal, claiming it strips businesses of their "due process" rights.

Food firms speak up

Food firms feel legislation is not the answer. Among *their* solutions:

• *Immediate, discretionary inspection.* NFPA and other industry representatives think FSIS can begin discretionary inspection immediately—without Congressional approval. "We feel FSIS already has the authority it needs," says NFPA President Charles Carey.

• *Stepped-up modernization.* Both industry and FSIS want to accelerate more economical modernization efforts. One new "streamlined" poultry inspection system has reduced the number of inspectors on each young-chicken production line from three to two.

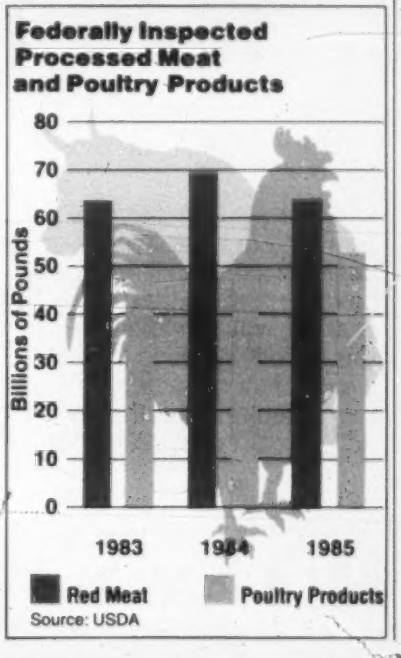
(Continued on next page)

ESTIMATED USER FEES
Cost per Carcass

Species	Inspection Costs	Administrative Cost	Total Costs
Poultry			
Young Chickens	.0205	.00011	.0206
Mature Chickens	.0191	.00010	.0192
Turkeys	.1068	.00055	.1074
Ducks	.0293	.00015	.0295

SOURCE: USDA

Budget cuts are forcing USDA to propose transferring the financial burden of mandatory meat and poultry inspection over to the food industry. USDA says 'user fees' can best be collected at the point of slaughter, calculated per carcass (above). Below, demand for processed poultry inspection services is rising—both good and bad news poultry processors. Commerce Dept. economists say this segment will grow 5 percent this year over 1985. But some predict that as budget cuts continue to take effect, and processors cannot receive additional inspection services, the growing poultry industry will suffer most.



Try these protein samples

The protein hydrolysates and food peptones in this free sample kit may be your first step in flavor enhancement, emulsification, foam stabilization, water binding, or nutritional supplementation. Working together, we can determine which of these materials will work best in your food system. Start the ball rolling. For prompt action, call collect 203-629-8754 or write:

Deltown Chemurgic CORPORATION
165 Mason Street
Greenwich, CT 06830

NEWS/WASHINGTON

(Continued from previous page)

Right now, though, streamlining efforts are hindered by financial restrictions on agency resources. Travel, training, salaries, inspection time and laboratory contracts have been drastically limited.

• *Other avenues.* The American Meat Institute has developed a task force that will research user-fee alternatives. The group will focus on slaughter and processing inspection procedures, administration costs and other enforcement programs.

The future

Unlike many issues grinding through Washington, the meat inspection problem will not take decades to resolve.

Efforts to trim spending so far "just aren't enough," says FSIS Administrator Houston. The agency has no choice but to find lasting solutions, and in the meantime, continue snipping its budget.

Adds FSIS's Drayne: "We'll get through fiscal 1986, which ends September 30, with some difficulties. As for fiscal 1987 and beyond, we just don't know."

CAPITAL CAPSULES

USDA announces heptachlor test results

Tests on meat samples for heptachlor residues show that only 12 of 352 samples contain illegal levels of the pesticide. The testing began after the Food and Drug Administration discovered heptachlor in milk from dairy herds in Arkansas, Missouri and Oklahoma. "...There appears to be no widespread problem with heptachlor contamination of the meat supply," said Donald Houston, Food Safety and Inspection Service Administrator. Testing, however, will continue.

Fruit jelly, preserves, jams identity standards up for review

The Food and Drug Administration is asking you to review and compare the Codex and the existing U.S. standards of identity for fruit jellies, preserves and jams. Comments on the need for change in existing standards—if any—must be received by May 16. *Federal Register, March 17, 1986, Pg. 9063.*

For further information contact Howard Anderson, FDA (202) 485-0118.

Inotek International Corp. submits food additive petition

The Food and Drug Administration received a petition from Inotek International Corp. proposing that sucrose fatty acid esters be allowed for the preservation of certain fresh fruits. *Federal Register, April 14, 1986, Pg. 12644.*

For further information contact Blondell Anderson, FDA (202) 426-5487.

FE's Executive Advisory Board, 285 men and women who represent a microcosm of the total food and beverage industry, are helping us to probe trends and buying practices throughout 1986. In this second report, (the first, on capital spending, appeared in January, page 66), we find a shift in ingredient buying patterns, continuing emphasis on new product development, and some surprising reactions to consumer trends such as low-sodium, low-sugar and low-cholesterol foods.

SHIFTS COMING FOR PRODUCT DEVELOPMENT

That's the opinion of FE's Executive Advisory Board. Panel members see the flood of new products continuing, but with formulation changes to counter rising costs.

Like the New York Stock Exchange, the food industry is bullish these days. The motto for product developers, echoing the Dow Jones Index, might be "Onward and upward." But it won't all be roses. A shaky economy, tight money and the current regulatory climate could hamper new product introductions. Furthermore, developing new products is fast becoming the province of large food companies.

That's the consensus of opinion of *Food Engineering's* Executive Advisory Board, 285 men and women who represent a wide range of disciplines, industry branches and company sizes. This panel of food-industry experts recently answered a series of questions about current trends and factors that affect ingredient buying patterns. And a statistical evaluation of their replies by Forge Products Research Division, which conducted the survey, points to a busy year for food marketers.

In general, the outlook for new product development is bright. On the downside, food processors are worried about the growing expense of getting new items into the marketplace. The problem is marketing expense, lack of advertising clout and the rising cost of test marketing make new product introductions more difficult for smaller companies. "Time is money in regards to hitting the market first," notes one panelist. Another suggests that "buyouts of small companies could reduce the number of 'truly' new products."

Which trends count?

Natural ingredients and low-salt foods are the major new-product trends, according to one facet of FE's survey. When asked to rate seven health-related influences in terms of importance to their own food product development decisions, almost half of the panel members (47.7%) rated "Using Natural Ingredients" highest. Few (4.9%) rated it lowest, giving it a mean rating of 1.97 on a scale of 1-to-5. Bottlers rated using natural ingredients highest of all (60.6%). "The trend will continue toward natural ingredients and colors," says a panelist, "slowed only by the FDA."

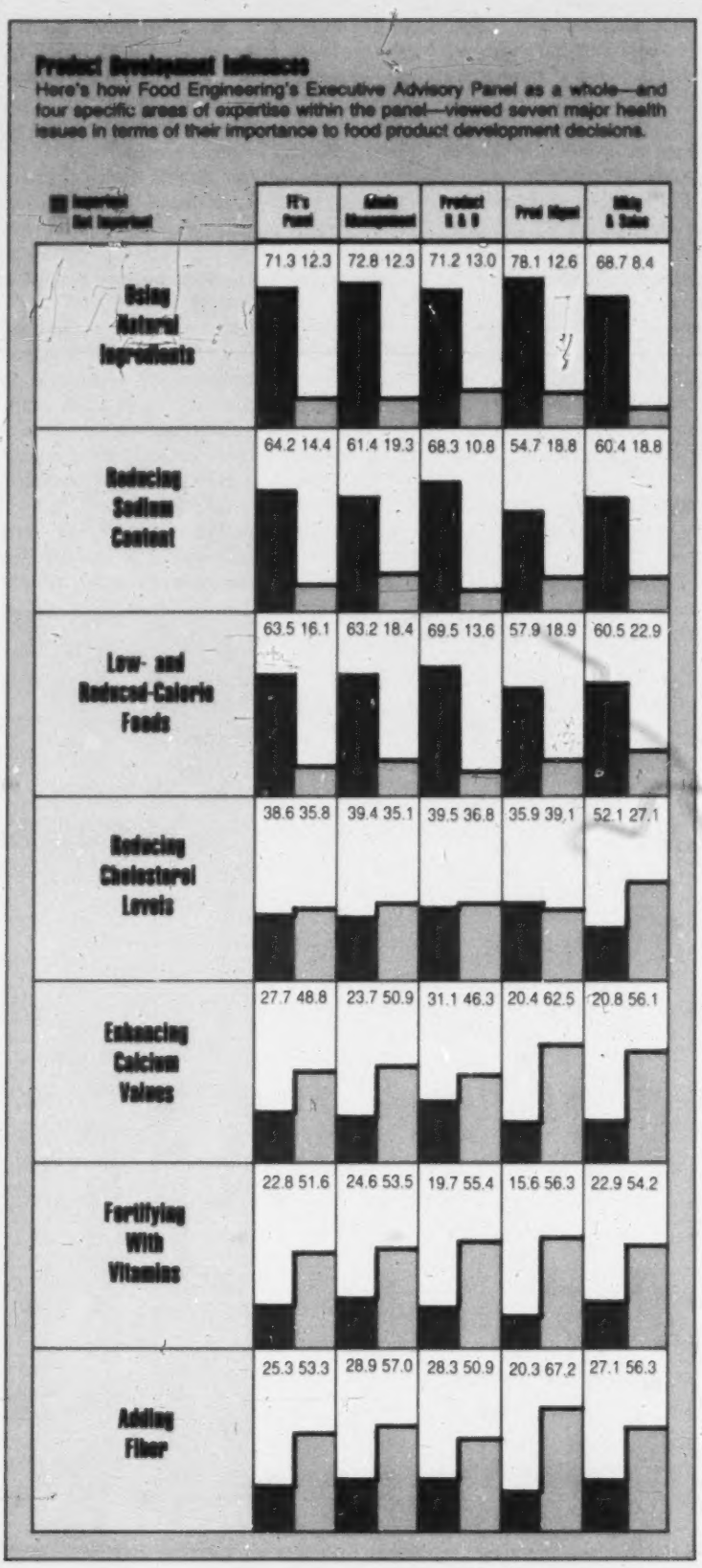
Next highest-rated trend (with a mean score of 2.26) was "Reducing the Sodium Content in Foods," followed (at 2.29) by "Formulating Low- or Reduced-Calorie Foods." Packers of canned or frozen fruits, vegetables and entrees were most concerned about sodium, while cutting calories appealed to everyone.

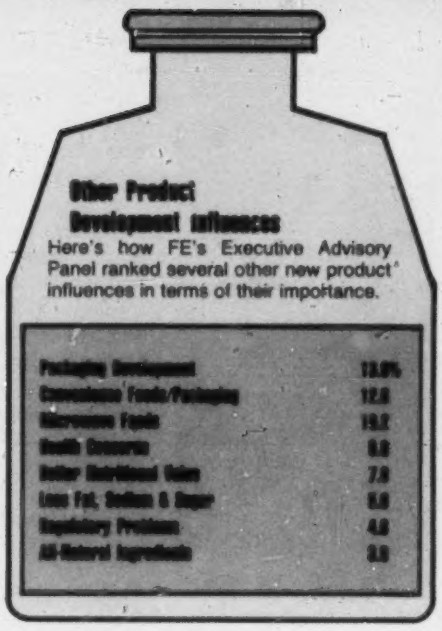
A moderate rating (2.98) was given to "Reducing Cholesterol Levels," with most panel members again agreeing. "Enhancing the Calcium Value of Products," however, although receiving an overall low rating of 3.42, was rated somewhat higher (2.85) by those involved with cereal or grain products. The same group also gave a high rating (2.64) to "Adding Fiber to Foods," which had the lowest (3.59) overall rating. "Fortifying Products with Vitamins," with a 3.56 rating, barely avoided last place—even though 33% of the panel rated it of little or no importance to them.

For simplicity, the numbers in the accompanying chart have been combined to emphasize which health-related factors are "important" or "not important." Responses rating an influence either 1 (very important) or 2 (somewhat important) have been lumped together, as have those rating an influence either 4 (not very important) or 5 (of little or no importance).

Asked to name other important trends that are influencing food development, the panelist's answers fell into a pattern. Several mentioned

KEVIN J. HANNIGAN, Features Editor




Other Product Development Influences
Here's how FE's Executive Advisory Panel ranked several other new product influences in terms of their importance.
Packaging Development 13.0%
Convenience Foods/Packaging 12.6
Microwave Foods 10.2
Health Concerns 9.8
Better Nutritional Value 7.9
Less Fat, Sodium & Sugar 6.9
Regulatory Problems 4.8
All-Natural Ingredients 3.9

packaging development trends (13.0%), and the continuing trend toward convenience foods (12.6%). Others related their comments to trends involving products for microwaves (10.2%), or to health concerns (9.8%).

"We see increased consumer awareness as a definite influence on new product development," said one panel member, "the trend to 'all natural' products wherever possible, along with wholesome, appealing products, rather than 'gimmicky' items." Another cited products that are "fresh, like homemade—especially hard to do with sodium and fat issues."

An obviously thoughtful panelist noted that "There's a greater tendency now to make sure that a new food product (in its conceptual stage) fits into a larger dietary/nutritional scheme rather than to approach it as an isolated product unrelated to other products." To achieve that end, another panel member says, "Companies are now getting into the entire action of a product from making all their own spices, processing their own vegetables and meat (in-plant), along with all packaging."

Worried about price, supply

Which product development influences panel members see as important or not important becomes significant when compared to the same panel's concern with ingredient prices and supply. Given a list of 24 categories of food ingredients, and asked to check up to three categories in which they were most concerned about rising prices, these food experts most often selected Natural Flavors (33.3%), Seasonings & Spices (26.3%) and Fats & Oils (24.6%). Also high on the "worried" list were Corn Sweeteners (19.3%), Cheese (17.2%), Sucrose Sweeteners (14.4%) and Cocoa (14.4%).

(Continued on page 92)

Some categories were mentioned more often, of course, by panelists who were more affected than others. For instance, 50.0% of those making meat products are worried about the cost of Seasonings & Spices, while confectioners are concerned about Fats & Oils (30.6%) and Sucrose Sweeteners (28.6%).

Using the same list, panelists then checked categories in which their companies are now seeking new or additional sources of supply. Generally, their choices parallel concerns about rising prices. Often cited were Natural Flavors (35.4%), Seasonings & Spices (24.2%) and Fats & Oils (21.8%). In some cases, though, their choices were surprising. For instance, only 10.2% were concerned about rising prices for Artificial Flavors, but 23.9% said they're looking for new sources of supply.

Ingredient systems gaining

Among the comments about "other" trends were several concerning the sources of ingredients. There's a trend toward "cleaner" labels, for example, with either "all-natural" ingredients or fewer additives. The need, said one panel member, is for "more natural ingredients from easily defined sources." Another asked for "more freedom in formulation as long as an accurate descriptive name is used."

FE's panel enlarged on this when discussing ingredient systems—defined as "special sauces, mixes or other preparations where the supplier provides a prepared ingredient comprising a number of different components such as flavors, seasonings, stabilizers, etc."

Ingredient systems do not presently account for a very large share of ingredient purchases, but their use is significant and is expected to grow. Over a quarter (26.0%) of panel members say that their companies do not buy any ingredient systems now, but only about a sixth (17.5%) expect this to be the case in five years. Less than a quarter (24.2%) say that 10% or more of their ingredient purchases are now made as systems, but two out of five (40.3%) expect to buy 10% or more of their ingredients

Ingredients of Food Industry Price/Supply Concern

Here's how the food industry sees current ingredient price trends, and what each area of the industry plans to do about it. In many cases, even where price is not a major problem, processors are looking for new sources of supply.

■ Concerned About Prices
■ Seeking New Sources

	Acidulants	Antioxidants/ Preservatives	Cheese	Cocoa	Colors	Dehydrated Dairy Products	Dehydrated Fruits/Veg.	Emulsifiers	Enzymes	Fats & Oils	Artificial Flavors	Natural Flavors	Flavor Enhancers
Meat Products	1.2	9.5	22.1	9.3	4.7	7.0	9.3	4.7	7.0	20.9	4.7	29.1	3.5
Bakery Products	1.1	3.3	22.5	20.7	2.2	6.5	15.2	5.4	3.3	41.3	6.5	23.9	7.6
Dairy Products	2.3	3.4	21.6	24.1	3.4	10.3	10.3	8.0	8.0	17.2	8.0	41.4	3.4
Flavors/Food Ing.	4.8	9.5	21.4	14.3	7.1	4.8	16.7	7.1	7.1	19.0	10.7	38.9	8.3
Canned Fruit/Veg.	9.5	6.5	21.7	13.0	4.3	4.3	13.0	—	4.3	15.2	6.5	24.8	—
Fats & Oils	—	10.2	24.5	16.3	6.1	—	12.2	8.2	6.1	44.9	10.2	36.6	2.0
Frozen Fruit/Veg.	3.8	3.8	20.8	5.7	—	5.7	17.0	1.9	7.5	9.4	3.4	24.8	5.7
Confectionery Prod.	—	4.1	18.4	24.5	—	8.2	12.2	6.1	6.1	30.6	10.2	34.7	6.1
Cereal/Grain Prod.	1.8	7.0	24.6	8.8	7.0	10.5	21.1	10.5	3.5	17.5	7.0	36.8	6.6
Beverages	10.6	7.6	10.6	10.6	7.6	4.5	10.6	9.1	9.1	7.6	16.7	47.0	4.5
Other Food Prod.	7.0	5.6	23.9	8.5	14.1	4.2	4.2	8.5	8.9	26.8	12.7	35.2	7.0
Total	3.9	6.7	17.2	14.4	5.6	6.0	9.6	5.3	6.7	24.6	10.2	33.3	4.6

this way five years from now.

The meat products category stands out as the one that is most active in making ingredient systems purchases. Over a third (36.0%) of the respondents involved with meat products say that they now purchase 10% or more of their ingredients this way, and over half (57%) will purchase 10% or more this way in 1990.

Packaging spurs R&D

Packaging was cited again and again as a spur to new product development. "New packaging concepts will allow the marketing of many new products" was a typical comment. Easy-to-handle aseptic and convenience packaging were popular concepts, along with new materials and processes. Microwaveable and single-serve packs, in particular, were cited as influencing new product development.

However, new concepts such as microwaveable packages and barrier plastics may become more important than the products they

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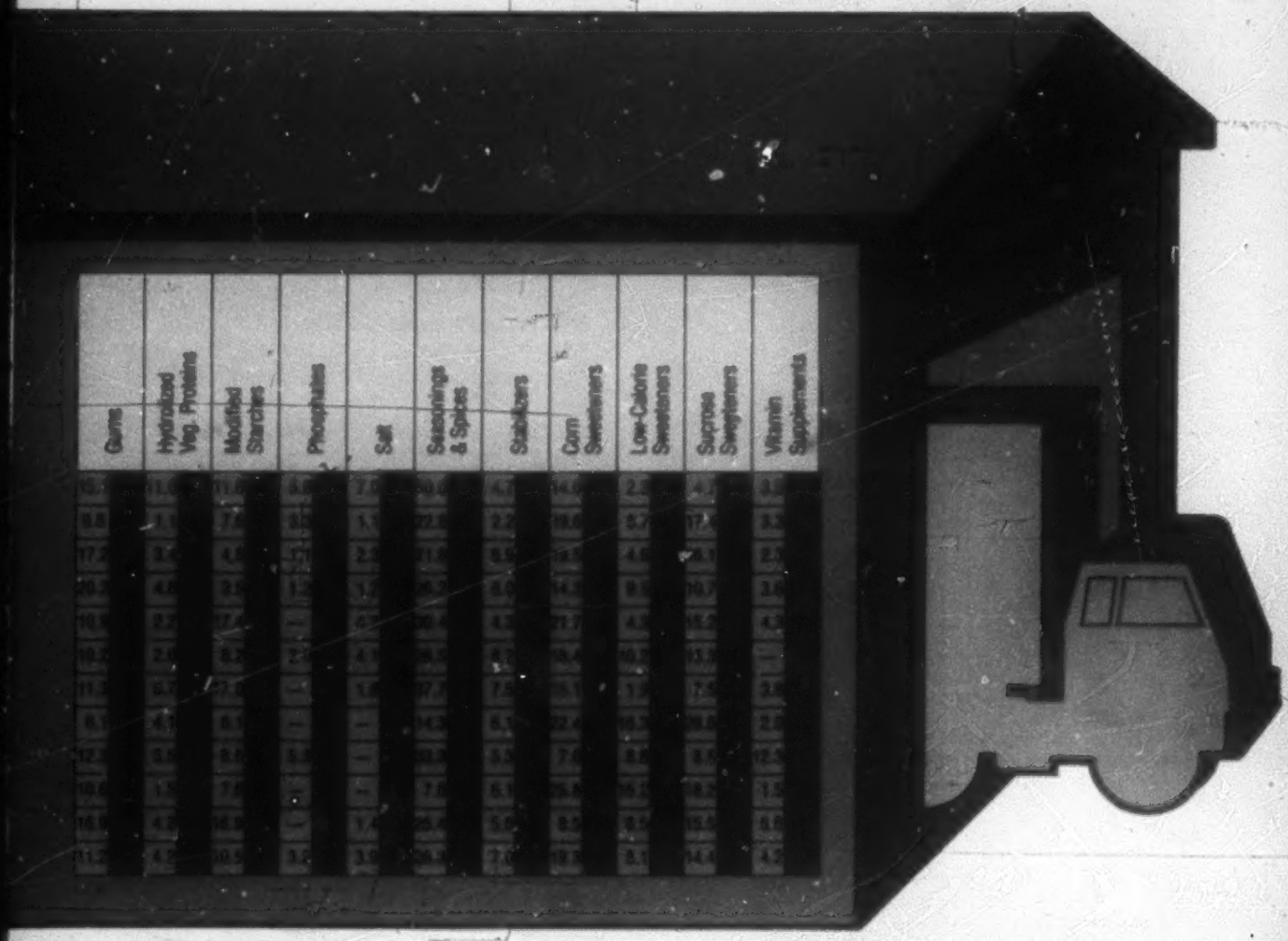
Ingredient Systems: A Major Trend?

Ingredient systems—blends or premixes of key ingredients—do not represent a large percentage of ingredient purchases at present. But their use is significant, and should increase in the future.

Spread Rate	Small (less than 100 workers)	Medium (100-499 workers)	Large (500 or more workers)
None	55.0%	23.0%	14.0%
Less Than 10%	33.7	41.0	43.7
10-19%	12.0	19.0	15.0
20-50%	5.0	4.0	5.0
50% or More	5.0	7.0	7.0



contain, notes a panelist. And new plastic laminates, although exciting, point up the need for improved antioxidants for some products packaged in less-costly plastic containers.

Rising costs for packaging materials are a problem, too. And not just for consumer packages. Another cry of food professionals is for newer bulk packaging systems that will reduce overall purchasing costs.

Among the value-added characteristics that new packaging can give a product were extended shelf life and safety through improved tamper-evident devices. "Shelf-life considerations in the refrigerated food industry (a fast-growing category) is one factor that greatly influences new product acceptance," explains an FE expert. And there were many calls for "Products that are safety sealed."

Trends to watch

Now causing changes in the marketplace are new methods of food preparation such as microwave ovens and upscale refrigerated foods such as gourmet salads. Other factors which could lead to new and different food products are new processing methods such as extrusion cooking, membrane separation and irradiation.

In packaging, smaller units are likely to become more important. "There's a trend to more frequent eating, but of smaller portions," is how one panelist put it. Furthermore, changing demographics point to a need for more "single" meals which are inexpensive yet satisfying while containing fewer than 300 calories.

"The trend toward 'lite' foods is definitely increasing," says a panelist. "No longer satisfied with diet bars or drinks, the consumer is demanding complete meals (instead of components) which are both satisfying and nutritious. An obvious extension would be lite desserts and snacks to complement these."

This trend might include packaging desserts for diabetics that are balanced in terms of dietary needs—with a known amount of cholesterol, fat, salt, sugar, calories, etc. The potential market is about 50-60 million customers.

New New Product Development Activity Is Ebbing
Over half of FE's expert panel reports increased new product activity at their companies; only 7.7% say that new product development is slowing down.
Small
Medium
Large
Slowing
Steady
Increasing